

10/539956

JC09 Rec'd PCT/PTO 17 JUN 2005

SEQUENCE LISTING

<110> NORRIS, STEVEN J.

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<141> 2005-06-17

<150> PCT/US2003/04118

<151> 2003-12-22

<150> 60/435,077

<151> 2002-12-20

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<170> PatentIn Ver. 2.1

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 aaa aat aaa aaa tat tca caa agc aac atc ctt tat tat ttt aat gaa 8366  
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     35                   40                   45  
  
 aat tta aaa aga aat ggg caa acc cct att aaa ata aaa aca tta caa 8414  
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 tat aaa cac ttg ggg gtt aat tgt gga acc gaa att tac tat aaa ctt 8510  
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 aaa tat caa aaa caa aaa tgc tat cat aaa ata aac caa tat ttt aaa 8558  
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     115                   120                   125  
  
 aaa aaa cac tca aaa aaa ggg agt gta gaa tta aag gaa tgt aat aat 8654  
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Asn Lys Lys Tyr Ser Gln Ser Asn Ile Leu Tyr Tyr Phe Asn Glu Asn			
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Leu Lys Arg Asn Gly Gln Thr Pro Ile Lys Ile Lys Thr Leu Gln Asn			
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Tyr Leu Tyr Lys Leu Glu Lys Glu Phe Glu Val Thr Thr Asn Tyr Tyr			
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Tyr Gln Lys Gln Lys Cys Tyr His Lys Ile Asn Gln Tyr Phe Lys Lys			
100	105	110	
Lys Lys Glu Ile Lys Phe Asn Leu Arg Val Ser Ala Phe Phe Asn Lys			
115	120	125	
Lys His Ser Lys Lys Gly Ser Val Glu Leu Lys Glu Cys Asn Asn Asn			
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Asn Asn Asn Lys Glu Lys Glu Thr Ser Gln Lys Ile Glu Ile Leu Gln			
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Ala Phe Gly Lys Asp Gly Asp Ala Leu Thr Gly Val Ala Lys Ala Ala  
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gag aat gat gct aac aag gat gcg ggg aag ttg ttt gct ggt aag aat 144  
Glu Asn Asp Ala Asn Lys Asp Ala Gly Lys Leu Phe Ala Gly Lys Asn  
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gcg gtt agt ggg gag cag ata cta aaa gct att gtt gag gcg gct ggt 240  
Ala Val Ser Gly Glu Gln Ile Leu Lys Ala Ile Val Glu Ala Ala Gly  
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gat gcg gat cag gcg ggt gta aag gct gat gcg gct aag aat ccg att 288  
Asp Ala Asp Gln Ala Gly Val Lys Ala Asp Ala Ala Lys Asn Pro Ile  
85 90 95

gca gct gcg att ggg act gct gat gat ggt gct gcg ttt ggt aag gat 336  
Ala Ala Ala Ile Gly Thr Ala Asp Asp Gly Ala Ala Phe Gly Lys Asp  
100 105 110

gag atg aag aag aga aat gat aag att gtt gca gct att gtt ttg agg 384  
Glu Met Lys Lys Arg Asn Asp Lys Ile Val Ala Ala Ile Val Leu Arg  
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<213> Borrelia afzelii

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35 40 45

Gly Asn Ala Gly Ala Ala Asp Ile Ala Lys Ala Ala Ala Ala Val Thr  
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Ala Val Ser Gly Glu Gln Ile Leu Lys Ala Ile Val Glu Ala Ala Gly  
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Asp Ala Asp Gln Ala Gly Val Lys Ala Asp Ala Ala Lys Asn Pro Ile  
85 90 95

Ala Ala Ala Ile Gly Thr Ala Asp Asp Gly Ala Ala Phe Gly Lys Asp  
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gct gca gct aat cag gcg ggt aaa aag gct gcg gat gct aag aat ccg 288  
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att gcg gct gcg att ggg act gct gat gat ggg gcg gag ttt aag gat 336  
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35 40 45

Gly Ala Gly Ala Ala Asp Ala Ile Gly Lys Ala Ala Ala Val Thr  
50 55 60

Ala Val Ser Gly Glu Gln Ile Leu Lys Ala Ile Val Asp Ala Ala Gly  
65 70 75 80

Ala Ala Ala Asn Gln Ala Gly Lys Lys Ala Ala Asp Ala Lys Asn Pro  
85 90 95

Ile Ala Ala Ala Ile Gly Thr Ala Asp Asp Gly Ala Glu Phe Lys Asp  
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 Ala Phe Gly Lys Glu Gly Asp Ala Leu Lys Asp Val Ala Lys Val Ala  
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 Asn Gly Asn Ala Gly Gly Ala Ala Asp Ala Asp Ile Ala Lys Ala Ala  
 50 55 60  
  
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 Ala Ala Val Thr Ala Val Ser Gly Glu Gln Ile Leu Lys Ala Ile Val  
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 Glu Ala Ala Gly Ala Ala Asp Gln Ala Gly Val Lys Ala Glu Glu Ala  
 85 90 95  
  
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 Lys Asn Pro Ile Ala Ala Ala Ile Gly Thr Asp Asp Ala Gly Ala Ala  
 100 105 110  
  
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 Glu Phe Gly Glu Asn Asp Met Lys Lys Asn Asp Asn Ile Ala Ala Ala  
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Lys Asn Pro Ile Ala Ala Ala Ile Gly Thr Asp Asp Ala Gly Ala Ala			
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Asp Gly Ala Gly Asp Ala Ala Asn Gln Ala Gly Lys Lys Ala Ala Glu			
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gct aag aat ccg att gcg gct gcg att ggg act aat gaa gct ggg gcg 335			
Ala Lys Asn Pro Ile Ala Ala Ile Gly Thr Asn Glu Ala Gly Ala			
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115	120	125	

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35 40 45

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Ala Val Ser Ala Val Ser Gly Glu Gln Ile Leu Lys Ala Ile Val Asp  
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85 90 95

Lys Asn Pro Ile Ala Ala Ala Ile Gly Thr Asn Glu Ala Gly Ala Glu  
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<210> 16  
 <211> 396  
 <212> DNA  
 <213> *Borrelia garinii*

<220>  
 <221> CDS  
 <222> (2)..(394)

<400> 16  
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 Gly Ile Lys Gly Ile Val Asp Ala Ala Glu Lys Ala Asp Ala Lys Glu  
 1 5 10 15

ggg aag ttg aat gct gct ggt gag ggt acg act aac gcg gat gct 97  
 Gly Lys Leu Asn Ala Ala Gly Ala Glu Gly Thr Thr Asn Ala Asp Ala  
 20 25 30

ggg aag ttg ttt gtg aag aat gct ggt aat gtg ggt ggt gaa gca ggt 145  
 Gly Lys Leu Phe Val Lys Asn Ala Gly Asn Val Gly Gly Glu Ala Gly  
 35 40 45

gat gct ggg aag gct gct gct gct gct gtt agt ggg gag cag 193

Asp Ala Gly Lys Ala Ala Ala Val Ala Ala Val Ser Gly Glu Gln			
50	55	60	
ata tta aaa gcg att gtt gat gct gct aag gat ggt ggt gag aag cag			241
Ile Leu Lys Ala Ile Val Asp Ala Ala Lys Asp Gly Gly Glu Lys Gln			
65	70	75	80
ggt aag aag gct gcg gat gct aca aat ccg att gag gcg gct att ggg			289
Gly Lys Lys Ala Ala Asp Ala Thr Asn Pro Ile Glu Ala Ala Ile Gly			
85	90	95	
ggt gcg ggt gat aat gat gct gct gcg gcg ttt gct act atg aag aag			337
Gly Ala Gly Asp Asn Asp Ala Ala Ala Ala Phe Ala Thr Met Lys Lys			
100	105	110	
gat gat cag att gct gct gct atg gtt ctg agg gga atg gct aag gat			385
Asp Asp Gln Ile Ala Ala Met Val Leu Arg Gly Met Ala Lys Asp			
115	120	125	
ggg cag ttt gc			396
Gly Gln Phe			
130			
<210> 17			
<211> 131			
<212> PRT			
<213> Borrelia garinii			
<400> 17			
Gly Ile Lys Gly Ile Val Asp Ala Ala Glu Lys Ala Asp Ala Lys Glu			
1	5	10	15
Gly Lys Leu Asn Ala Ala Gly Ala Glu Gly Thr Thr Asn Ala Asp Ala			
20	25	30	
Gly Lys Leu Phe Val Lys Asn Ala Gly Asn Val Gly Gly Glu Ala Gly			
35	40	45	
Asp Ala Gly Lys Ala Ala Ala Val Ala Ala Val Ser Gly Glu Gln			
50	55	60	
Ile Leu Lys Ala Ile Val Asp Ala Ala Lys Asp Gly Gly Glu Lys Gln			
65	70	75	80
Gly Lys Lys Ala Ala Asp Ala Thr Asn Pro Ile Glu Ala Ala Ile Gly			
85	90	95	
Gly Ala Gly Asp Asn Asp Ala Ala Ala Phe Ala Thr Met Lys Lys			
100	105	110	
Asp Asp Gln Ile Ala Ala Met Val Leu Arg Gly Met Ala Lys Asp			
115	120	125	
Gly Gln Phe			
130			

<210> 18

<211> 390

<212> DNA

<213> Borrelia garinii

<220>

<221> CDS

<222> (2)..(388)

<400> 18

g ggg ata aag ggg att gtt gat gct gct gag aag gct gat gcg aag gaa 49  
Gly Ile Lys Gly Ile Val Asp Ala Ala Glu Lys Ala Asp Ala Lys Glu  
1 5 10 15

ggg aag ttg gat gtg gct ggt gat gct ggt gaa act aac aag gat gct 97  
Gly Lys Leu Asp Val Ala Gly Asp Ala Gly Glu Thr Asn Lys Asp Ala  
20 25 30

ggg aag ttg ttt gtg aag aat aat gag ggt ggt gaa gca aat gat 145  
Gly Lys Leu Phe Val Lys Lys Asn Asn Glu Gly Gly Glu Ala Asn Asp  
35 40 45

gct ggg aag gct gct gcg gtt gct gct gtt agt ggg gag cag ata 193  
Ala Gly Lys Ala Ala Ala Ala Val Ala Ala Val Ser Gly Glu Gln Ile  
50 55 60

tta aaa gcg att gtt gat gct gct gag ggt ggt gag aag cag ggt aag 241  
Leu Lys Ala Ile Val Asp Ala Ala Glu Gly Gly Glu Lys Gln Gly Lys  
65 70 75 80

aag gct gcg gat gct aca aat ccg att gag gcg gct att ggg ggt gcg 289  
Lys Ala Ala Asp Ala Thr Asn Pro Ile Glu Ala Ala Ile Gly Gly Ala  
85 90 95

ggt gat aat gat gct gct gcg gcg ttt gct act atg aag aag gat gat 337  
Gly Asp Asn Asp Ala Ala Ala Phe Ala Thr Met Lys Lys Asp Asp  
100 105 110

cag att gct act gct atg gtt ctg agg gga atg gct aag gat ggg cag 385  
Gln Ile Ala Thr Ala Met Val Leu Arg Gly Met Ala Lys Asp Gly Gln  
115 120 125

ttt gc 390  
Phe

<210> 19

<211> 129

<212> PRT

<213> Borrelia garinii

<400> 19

Gly Ile Lys Gly Ile Val Asp Ala Ala Glu Lys Ala Asp Ala Lys Glu  
1 5 10 15

Gly Lys Leu Asp Val Ala Gly Asp Ala Gly Glu Thr Asn Lys Asp Ala  
20 25 30

Gly Lys Leu Phe Val Lys Lys Asn Asn Glu Gly Gly Glu Ala Asn Asp  
35 40 45

Ala Gly Lys Ala Ala Ala Val Ala Ala Val Ser Gly Glu Gln Ile  
50 55 60

Leu Lys Ala Ile Val Asp Ala Ala Glu Gly Gly Glu Lys Gln Gly Lys  
65 70 75 80

Lys Ala Ala Asp Ala Thr Asn Pro Ile Glu Ala Ala Ile Gly Gly Ala  
85 90 95

Gly Asp Asn Asp Ala Ala Ala Phe Ala Thr Met Lys Lys Asp Asp  
100 105 110

Gln Ile Ala Thr Ala Met Val Leu Arg Gly Met Ala Lys Asp Gly Gln  
115 120 125

Phe

<210> 20

<211> 390

<212> DNA

<213> *Borrelia garinii*

<220>

<221> CDS

<222> (2)..(388)

<400> 20

g ggg ata aag ggg att gtt gat gct gct gag aag gct gat gcg aag gaa 49  
Gly Ile Lys Gly Ile Val Asp Ala Ala Glu Lys Ala Asp Ala Lys Glu  
1 5 10 15

ggg agg ttg gat gtg gct ggt gat gct ggt gaa act aac aag gat gct 97  
Gly Arg Leu Asp Val Ala Gly Asp Ala Gly Glu Thr Asn Lys Asp Ala  
20 25 30

ggg aag ttg ttt gtg aag aag aat aat gag ggt ggt gaa gca aat gat 145  
Gly Lys Leu Phe Val Lys Lys Asn Asn Glu Gly Gly Glu Ala Asn Asp  
35 40 45

gct ggg aag gct gct gct gcg gtt gct gct gtt agt ggg gag cag ata 193  
Ala Gly Lys Ala Ala Ala Val Ala Ala Val Ser Gly Glu Gln Ile  
50 55 60

tta aaa gcg att gtt gat gct gct gag ggt ggt gag aag cag ggt aag 241  
Leu Lys Ala Ile Val Asp Ala Ala Glu Gly Gly Glu Lys Gln Gly Lys  
65 70 75 80

aag gct gcg gat gct aca aat ccg att gag gcg gct att ggg ggt gcg 289

Lys Ala Ala Asp Ala Thr Asn Pro Ile Glu Ala Ala Ile Gly Gly Ala			
85	90	95	
ggt gat aat gat gct gct gcg gcg ttt gct act atg aag aag gat gat			337
Gly Asp Asn Asp Ala Ala Ala Phe Ala Thr Met Lys Lys Asp Asp			
100	105	110	
cag att gct gct gct atg gtt ctg agg gga atg gct aag gat ggg cag			385
Gln Ile Ala Ala Ala Met Val Leu Arg Gly Met Ala Lys Asp Gly Gln			
115	120	125	
ttt gc			390
Phe			

<210> 21  
 <211> 129  
 <212> PRT  
 <213> *Borrelia garinii*

<400> 21  
 Gly Ile Lys Gly Ile Val Asp Ala Ala Glu Lys Ala Asp Ala Lys Glu  
 1 5 10 15

Gly Arg Leu Asp Val Ala Gly Asp Ala Gly Glu Thr Asn Lys Asp Ala  
 20 25 30

Gly Lys Leu Phe Val Lys Lys Asn Asn Glu Gly Glu Ala Asn Asp  
 35 40 45

Ala Gly Lys Ala Ala Ala Val Ala Ala Val Ser Gly Glu Gln Ile  
 50 55 60

Leu Lys Ala Ile Val Asp Ala Ala Glu Gly Glu Lys Gln Gly Lys  
 65 70 75 80

Lys Ala Ala Asp Ala Thr Asn Pro Ile Glu Ala Ala Ile Gly Gly Ala  
 85 90 95

Gly Asp Asn Asp Ala Ala Ala Phe Ala Thr Met Lys Lys Asp Asp  
 100 105 110

Gln Ile Ala Ala Ala Met Val Leu Arg Gly Met Ala Lys Asp Gly Gln  
 115 120 125

Phe

<210> 22  
 <211> 339  
 <212> DNA  
 <213> *Borrelia garinii*

<220>  
 <221> CDS

<222> (2) .. (337)

<400> 22  
g ggg ata aag ggg att gtt gat gct gct ggt gaa act aac aag gat gct 49  
Gly Ile Lys Gly Ile Val Asp Ala Ala Gly Glu Thr Asn Lys Asp Ala  
1 5 10 15  
  
ggg aag ttg ttt gtg aag aag aat aat gag ggt ggt gaa gca aat gat 97  
Gly Lys Leu Phe Val Lys Lys Asn Asn Glu Gly Glu Ala Asn Asp  
20 25 30  
  
gct ggg aag gct gct gct gcg gtt gct gct gtt agt ggg gag cag ata 145  
Ala Gly Lys Ala Ala Ala Ala Val Ala Ala Val Ser Gly Glu Gln Ile  
35 40 45  
  
tta aaa gcg att gtt gat gct gct gag ggt ggt gag aag cag ggt aag 193  
Leu Lys Ala Ile Val Asp Ala Ala Glu Gly Glu Lys Gln Gly Lys  
50 55 60  
  
aag gct gcg gat gct aca aat ccg att gag gcg gct att ggg ggt aca 241  
Lys Ala Ala Asp Ala Thr Asn Pro Ile Glu Ala Ala Ile Gly Gly Thr  
65 70 75 80  
  
aat gat aat gat gct gcg gcg ttt gct act atg aag aag gat gat cag 289  
Asn Asp Asn Asp Ala Ala Phe Ala Thr Met Lys Lys Asp Asp Gln  
85 90 95  
  
att gct gct gct atg gtt ctg agg gga atg gct aag gat ggg cag ttt 337  
Ile Ala Ala Ala Met Val Leu Arg Gly Met Ala Lys Asp Gly Gln Phe  
100 105 110  
  
gc 339

<210> 23  
<211> 112  
<212> PRT  
<213> *Borrelia garinii*

<400> 23  
Gly Ile Lys Gly Ile Val Asp Ala Ala Gly Glu Thr Asn Lys Asp Ala  
1 5 10 15  
  
Gly Lys Leu Phe Val Lys Lys Asn Asn Glu Gly Glu Ala Asn Asp  
20 25 30  
  
Ala Gly Lys Ala Ala Ala Ala Val Ala Ala Val Ser Gly Glu Gln Ile  
35 40 45  
  
Leu Lys Ala Ile Val Asp Ala Ala Glu Gly Glu Lys Gln Gly Lys  
50 55 60  
  
Lys Ala Ala Asp Ala Thr Asn Pro Ile Glu Ala Ala Ile Gly Gly Thr  
65 70 75 80  
  
Asn Asp Asn Asp Ala Ala Ala Phe Ala Thr Met Lys Lys Asp Asp Gln  
85 90 95

Ile Ala Ala Ala Met Val Leu Arg Gly Met Ala Lys Asp Gly Gln Phe  
100 105 110

<210> 24  
<211> 21  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 24  
ccagcaaaca acttcccccgc c 21

<210> 25  
<211> 24  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 25  
atcccttaaac tccgccccat catc 24

<210> 26  
<211> 28  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 26  
gagtgcgtg gagagtgctg ttgatgag 28

<210> 27  
<211> 27  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 27  
ggggataaag gggattgttg atgctgc 27

<210> 28  
<211> 26  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic Primer

<400> 28  
gcaaactgcc catccttagc cattcc 26

<210> 29  
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<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic Primer

<400> 29  
aaggggattg cgaaggggat aaagg 25

<210> 30  
<211> 27  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic Primer

<400> 30  
ttagcagcaa actttccatc cttagcc 27

<210> 31  
<211> 5897  
<212> DNA  
<213> Borrelia garinii

<400> 31  
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taattatattaa atactattca gcagtaaattt ctataagtca ttaattatattt aatactattc 180  
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 <212> PRT  
 <213> *Borrelia garinii*

<400> 32  
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Ile Gln Leu Gly Asn Gly Phe Leu Asp Val Phe Thr Ser Phe Gly Gly  
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Leu Val Ala Asp Ala Leu Gly Phe Lys Ala Asp Pro Lys Lys Ser Asp  
 35 40 45

Val Lys Thr Tyr Phe Glu Ser Leu Ala Lys Lys Leu Glu Glu Thr Lys  
 50 55 60

Asp Gly Leu Thr Lys Leu Ser Lys Gly Asn Asp Gly Asp Thr Gly Lys  
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Ala Gly Asp Ala Gly Gly Ala Gly Gly Ala Ser Ala Ala Gly Gly  
 85 90 95

Ala Gly Gly Ile  
100

<210> 33  
<211> 34  
<212> PRT  
<213> *Borrelia garinii*

<400> 33  
Gly Phe Lys Ala Asp Pro Lys Lys Ser Asp Val Lys Thr Tyr Phe Glu  
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Ser Leu Ala Lys Lys Leu Glu Glu Thr Lys Asp Gly Leu Thr Lys Leu  
20 25 30

Ser Lys

<210> 34  
<211> 96  
<212> PRT  
<213> *Borrelia garinii*

<400> 34  
Glu Gly Ala Ile Thr Glu Ile Ser Lys Trp Leu Asp Asp Met Ala Lys  
1 5 10 15

Ala Ala Ala Glu Ala Ala Ser Ala Ala Thr Gly Asn Ala Ala Ile Gly  
20 25 30

Asp Val Val Asn Gly Asn Gly Gly Ala Ala Lys Gly Gly Asp Ala Glu  
35 40 45

Ser Val Asn Gly Ile Ala Lys Gly Ile Lys Gly Ile Val Asp Ala Ala  
50 55 60

Glu Lys Ala Asp Ala Lys Glu Gly Lys Leu Asp Val Ala Gly Asp Ala  
65 70 75 80

Gly Gly Ala Gly Gly Ala Gly Ala Ala Gly Gly Ala Gly Gly Ile  
85 90 95

<210> 35  
<211> 198  
<212> PRT  
<213> *Borrelia garinii*

<400> 35  
Glu Gly Ala Ile Thr Glu Ile Ser Lys Trp Leu Asp Asp Met Ala Lys  
1 5 10 15

Ala Ala Ala Val Ala Ala Ser Ala Ala Ser Ala Ala Thr Gly Asn Ala  
20 25 30

Ala Ile Gly Asp Val Val Asn Gly Asn Asp Gly Ala Ala Lys Gly Gly  
35 40 45

Asp Ala Ala Ser Val Asn Gly Ile Ala Lys Gly Ile Lys Gly Ile Val  
50 55 60

Asp Ala Ala Glu Lys Ala Asp Ala Lys Glu Gly Lys Leu Asp Val Ala  
65 70 75 80

Gly Asp Ala Gly Glu Gly Asn Lys Asp Ala Gly Lys Leu Phe Val Lys  
85 90 95

Lys Asn Ala Gly Asp Glu Gly Glu Ala Asn Asp Ala Gly Lys Ala  
100 105 110

Ala Ala Ala Val Ala Ala Val Ser Gly Glu Gln Ile Leu Lys Ala Ile  
115 120 125

Val Asp Ala Ala Glu Gly Asp Asp Lys Gln Gly Lys Lys Ala Ala Asp  
130 135 140

Ala Thr Asn Pro Ile Glu Ala Ala Ile Gly Gly Ala Asp Ala Gly Ala  
145 150 155 160

Asn Ala Glu Ala Phe Asn Lys Met Lys Lys Asp Asp Gln Ile Ala Ala  
165 170 175

Ala Met Val Leu Arg Gly Met Ala Lys Asp Gly Gln Phe Ala Leu Lys  
180 185 190

Asp Asp Ala Ala Ala His  
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<210> 36

<211> 191

<212> PRT

<213> *Borrelia garinii*

<400> 36

Glu Gly Thr Val Lys Asn Ala Val Asp Met Ala Lys Ala Ala Ala Glu  
1 5 10 15

Ala Ala Ser Ala Ala Ser Ala Ala Thr Gly Ser Thr Thr Ile Gly Asp  
20 25 30

Val Val Lys Ser Gly Glu Ala Lys Asp Gly Asp Ala Ala Ser Val Asn  
35 40 45

Gly Ile Ala Lys Gly Ile Lys Gly Ile Val Asp Ala Ala Glu Lys Ala  
50 55 60

Asp Ala Lys Glu Gly Lys Leu Asp Val Ala Gly Ala Ala Gly Thr Thr  
65 70 75 80

Asn Val Asn Val Gly Lys Leu Phe Val Lys Asn Asn Gly Asn Glu Gly  
85 90 95

Gly Asp Ala Ser Asp Ala Gly Lys Ala Ala Ala Ala Val Ala Ala Val  
100 105 110

Ser Gly Glu Gln Ile Leu Lys Ala Ile Val Asp Ala Ala Lys Asp Gly  
115 120 125

Asp Lys Gln Gly Val Thr Asp Val Lys Asp Ala Thr Asn Pro Ile Glu  
130 135 140

Ala Ala Ile Gly Gly Thr Asn Asp Asn Asp Ala Ala Ala Phe Ala Thr  
145 150 155 160

Met Lys Lys Asp Asp Gln Ile Ala Ala Ala Met Val Leu Arg Gly Met  
165 170 175

Ala Lys Asp Gly Gln Phe Ala Leu Lys Asp Asp Ala Ala Lys Asp  
180 185 190

<210> 37

<211> 63

<212> PRT

<213> *Borrelia garinii*

<400> 37

Gly Asp Lys Thr Gly Val Ala Ala Asp Ala Glu Asn Pro Ile Asp Ala  
1 5 10 15

Ala Ile Gly Gly Ala Asp Ala Asp Ala Ala Ala Phe Asn Lys Glu Gly  
20 25 30

Met Lys Lys Asp Asp Gln Ile Ala Ala Ala Met Val Leu Arg Gly Met  
35 40 45

Ala Lys Asp Gly Gln Phe Ala Leu Thr Asn Asn Ala Ala Ala His  
50 55 60

<210> 38

<211> 192

<212> PRT

<213> *Borrelia garinii*

<400> 38

Glu Gly Thr Val Lys Asn Ala Val Asp Met Ala Lys Ala Ala Ala Val  
1 5 10 15

Ala Ala Ser Ala Ala Thr Gly Asn Ala Ala Ile Gly Asp Val Val Lys  
20 25 30

Ser Asn Gly Gly Ala Ala Ala Lys Gly Gly Asp Ala Ala Ser Val Asn  
35 40 45

Gly Ile Ala Lys Gly Ile Lys Gly Ile Val Asp Ala Ala Glu Lys Ala  
50 55 60

Asp Ala Lys Glu Gly Lys Leu Asp Val Ala Gly Ala Ala Gly Glu Thr  
65 70 75 80

Asn Lys Asp Ala Gly Lys Leu Phe Val Lys Lys Asn Gly Asp Asp Gly  
85 90 95

Gly Asp Ala Gly Asp Ala Gly Lys Ala Ala Ala Ala Val Ala Ala Val  
100 105 110

Ser Gly Glu Gln Ile Leu Lys Ala Ile Val Asp Ala Ala Lys Asp Gly  
115 120 125

Asp Lys Thr Gly Val Thr Asp Val Lys Asp Ala Thr Asn Pro Ile Asp  
130 135 140

Ala Ala Ile Gly Gly Ser Ala Asp Ala Asn Ala Glu Ala Phe Asp Lys  
145 150 155 160

Met Lys Lys Asp Asp Gln Ile Ala Ala Ala Met Val Leu Arg Gly Met  
165 170 175

Ala Lys Asp Gly Gln Phe Ala Leu Lys Asn Asn Asp His Asp Asn His  
180 185 190

<210> 39

<211> 112

<212> PRT

<213> *Borrelia garinii*

<400> 39

Lys Gly Thr Val Lys Asn Ala Val Asp Met Ala Lys Ala Ala Glu Glu  
1 5 10 15

Ala Ala Ser Ala Ala Ser Ala Ala Thr Gly Asn Ala Ala Ile Gly Asp  
20 25 30

Val Val Lys Asn Ser Gly Ala Ala Ala Lys Gly Gly Glu Ala Ala Ser  
35 40 45

Val Asn Gly Ile Ala Lys Gly Ile Lys Gly Ile Val Asp Ala Ala Gly  
50 55 60

Lys Ala Asp Ala Lys Glu Gly Lys Leu Asp Ala Thr Gly Ala Glu Gly  
65 70 75 80

Thr Thr Asn Val Asn Ala Gly Lys Leu Phe Val Lys Arg Ala Ala Asp  
85 90 95

Asp Gly Gly Asp Ala Asp Asp Ala Gly Lys Ala Ala Ala Val Ala  
100 105 110

<210> 40  
<211> 174  
<212> PRT  
<213> *Borrelia garinii*

<400> 40  
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Asp Val Ala Lys Ala Lys Gly Gly Asp Ala Ala Ser Val Asn Gly Ile  
20 25 30  
  
Ala Lys Gly Ile Lys Gly Ile Val Asp Ala Ala Glu Lys Ala Asp Ala  
35 40 45  
  
Lys Glu Gly Lys Leu Asn Ala Ala Gly Ala Glu Gly Thr Thr Asn Ala  
50 55 60  
  
Asp Ala Gly Lys Leu Phe Val Lys Asn Ala Gly Asn Val Gly Gly Glu  
65 70 75 80  
  
Ala Gly Asp Ala Gly Lys Ala Ala Ala Val Ala Ala Val Ser Gly  
85 90 95  
  
Glu Gln Ile Leu Lys Ala Ile Val Asp Ala Ala Lys Asp Gly Gly Glu  
100 105 110  
  
Lys Gln Gly Lys Lys Ala Ala Asp Ala Thr Asn Pro Ile Asp Ala Ala  
115 120 125  
  
Ile Gly Gly Thr Asn Asp Asn Asp Ala Ala Ala Phe Ala Thr Met  
130 135 140  
  
Lys Lys Asp Asp Gln Ile Ala Ala Ala Met Val Leu Arg Gly Met Ala  
145 150 155 160  
  
Lys Asp Gly Gln Phe Ala Leu Lys Asp Ala Ala Ala Ala His  
165 170

<210> 41  
<211> 195  
<212> PRT  
<213> *Borrelia garinii*

<400> 41  
Glu Gly Thr Val Lys Asn Ala Val Asp Ile Ile Lys Ala Ala Ala Glu  
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Ala Ala Ser Ala Ala Ser Ala Ala Thr Gly Ser Ala Ala Ile Gly Asp  
20 25 30

Val Val Asn Gly Asn Gly Ala Thr Ala Lys Gly Gly Asp Ala Lys Ser  
35 40 45

Val Asn Gly Ile Ala Lys Gly Ile Lys Gly Ile Val Asp Ala Ala Glu  
50 55 60

Lys Ala Asp Ala Lys Glu Gly Lys Leu Asp Val Ala Gly Asp Ala Gly  
65 70 75 80

Glu Thr Asn Lys Asp Ala Gly Lys Leu Phe Val Lys Asn Asn Gly Asn  
85 90 95

Glu Gly Gly Asp Ala Asp Asp Ala Gly Lys Ala Ala Ala Val Ala  
100 105 110

Ala Val Ser Gly Glu Gln Ile Leu Lys Ala Ile Val Asp Ala Ala Lys  
115 120 125

Gly Gly Asp Lys Thr Gly Lys Asn Asn Val Lys Asp Ala Glu Asn Pro  
130 135 140

Ile Glu Ala Ala Ile Gly Ser Ser Ala Asp Ala Asp Ala Ala Ala Phe  
145 150 155 160

Asn Lys Glu Gly Met Lys Lys Asp Asp Gln Ile Ala Ala Ala Met Val  
165 170 175

Leu Arg Gly Met Ala Lys Asp Gly Gln Phe Ala Leu Thr Asn Asp Ala  
180 185 190

Ala Ala His  
195

<210> 42  
<211> 197  
<212> PRT  
<213> *Borrelia garinii*

<400> 42  
Glu Gly Thr Val Lys Asn Ala Val Gly Ser Ala Thr Asn Lys Thr Val  
1 5 10 15

Val Ala Leu Ala Asn Leu Val Arg Lys Thr Val Gln Ala Gly Leu Lys  
20 25 30

Lys Val Gly Asp Val Val Lys Asn Ser Glu Ala Lys Asp Gly Asp Ala  
35 40 45

Ala Ser Val Asn Gly Ile Ala Lys Gly Ile Lys Gly Ile Val Asp Ala  
50 55 60

Ala Glu Lys Ala Asp Ala Lys Glu Gly Lys Leu Asp Val Ala Gly Ala  
65 70 75 80

Ala Gly Glu Thr Asn Lys Asp Ala Gly Lys Leu Phe Val Lys Lys Asn  
85 90 95

Asn Glu Gly Gly Glu Ala Asn Asp Ala Gly Lys Ala Ala Ala Ala Val  
100 105 110  
Ala Ala Val Ser Gly Glu Gln Ile Leu Lys Ala Ile Val Asp Ala Ala  
115 120 125  
Lys Asp Gly Asp Asp Lys Gln Gly Lys Lys Ala Glu Asp Ala Thr Asn  
130 135 140  
Pro Ile Asp Ala Ala Ile Gly Gly Ala Gly Ala Asn Ala Ala  
145 150 155 160  
Ala Ala Phe Asn Asn Met Lys Lys Asp Asp Gln Ile Ala Ala Ala Met  
165 170 175  
Val Leu Arg Gly Met Ala Lys Asp Gly Gln Phe Ala Leu Thr Asn Asn  
180 185 190  
Ala His Thr Asn His  
195

<210> 43  
<211> 198  
<212> PRT  
<213> *Borrelia garinii*

<400> 43  
Lys Gly Thr Val Lys Asn Ala Val Asp Met Thr Lys Ala Ala Ala Val  
1 5 10 15  
Ala Ala Ser Ala Ala Ser Ala Ala Thr Gly Asn Ala Ala Ile Gly Asp  
20 25 30  
Val Val Asn Gly Asn Asp Gly Ala Ala Lys Gly Gly Asp Ala Ala Ser  
35 40 45  
Val Asn Gly Ile Ala Lys Gly Ile Lys Gly Ile Val Asp Ala Ala Glu  
50 55 60  
Lys Ala Asp Ala Lys Glu Gly Lys Leu Asn Val Ala Gly Ala Ala Gly  
65 70 75 80  
Ala Glu Gly Asn Glu Ala Ala Gly Lys Leu Phe Val Lys Lys Asn Ala  
85 90 95  
Gly Asp His Gly Gly Glu Ala Gly Asp Ala Gly Arg Ala Ala Ala  
100 105 110  
Val Ala Ala Val Ser Gly Glu Gln Ile Leu Lys Ala Ile Val Asp Ala  
115 120 125  
Ala Lys Asp Gly Gly Asp Lys Gln Gly Lys Lys Ala Glu Asp Ala Glu  
130 135 140  
Asn Pro Ile Asp Ala Ala Ile Gly Ser Thr Gly Ala Asp Asp Asn Ala

145 150 155 160

Ala Glu Ala Phe Ala Thr Met Lys Lys Asp Asp Gln Ile Ala Ala Ala  
165 170 175

Met Val Leu Arg Gly Met Ala Lys Asp Gly Gln Phe Ala Leu Lys Asp  
180 185 190

Ala Ala His Asp Asn His  
195

<210> 44

<211> 86

<212> PRT

<213> Borrelia garinii

<400> 44

Lys Gly Thr Val Lys Asn Ala Val Asp Ile Ile Lys Ala Thr Ala Val  
1 5 10 15

Ala Ala Ser Ala Ala Thr Gly Ser Thr Thr Ile Gly Asp Val Val Lys  
20 25 30

Asn Gly Glu Ala Lys Gly Gly Glu Ala Lys Ser Val Asn Gly Ile Ala  
35 40 45

Lys Gly Ile Lys Gly Ile Val Asp Ala Ala Gly Lys Ala Asp Ala Lys  
50 55 60

Glu Gly Lys Leu Asn Val Ala Gly Ala Ala Gly Glu Gly Asn Glu Ala  
65 70 75 80

Ala Gly Lys Leu Phe Val  
85

<210> 45

<211> 71

<212> PRT

<213> Borrelia garinii

<400> 45

Val Asn Tyr Tyr Arg Ile Arg Thr Ser Val Arg Tyr Glu Ser Phe Gly  
1 5 10 15

Tyr Phe Ala Ala Ala Asn Glu Phe Glu Ile Ser Glu Val Lys Ile Ala  
20 25 30

Asp Val Asn Gly Thr His Phe Ile Ala Thr Lys Glu Lys Glu Ile Leu  
35 40 45

Tyr Asp Ser Leu Asp Leu Arg Ala Arg Gly Lys Ile Phe Glu Ile Thr  
50 55 60

Ser Lys Arg Met Phe Lys Leu  
65 70

<210> 46  
<211> 8762  
<212> DNA  
<213> Borrelia afzelii

<400> 46  
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aataatcagg gtgctgtac tgataaggac agtgttaagg ggattgcgaa gggataaaag 180  
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<212> PRT  
<213> *Borrelia afzelii*

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Lys Ile Gly Asp Val Gly Ala Ala Asn Asn Gln Gly Ala Val Ala Asp  
35 40 45

Lys Asp Ser Val Lys Gly Ile Ala Lys Gly Ile Lys Gly Ile Val Asp  
50 55 60

Ala Ala Gly Lys Ala Phe Gly Lys Asp Gly Asn Ala Leu Thr Gly Val  
65 70 75 80

Lys Glu Val Ala Asp Glu Ala Gly Ala Asn Glu Asp Ala Gly Lys Leu  
85 90 95

Phe Ala Gly Asn Ala Gly Asn Ala Ala Ala Asp Ile Ala Lys Ala  
100 105 110

Ala Gly Ala Val Thr Ala Val Ser Gly Glu Gln Ile Leu Lys Ala Ile  
115 120 125

Val Asp Gly Ala Gly Gly Ala Ala Gln Asp Gly Lys Lys Ala Ala Glu  
130 135 140

Ala Lys Asn Pro Ile Ala Ala Ala Ile Gly Ala Asp Ala Ala Gly Ala  
145 150 155 160

Asp Phe Gly Asp Asp Met Lys Lys Ser Asp Lys Ile Ala Ala Ala Ile  
165 170 175

Val Leu Arg Gly Val Ala Lys Ser Gly Lys Phe Ala Val Ala Asn Ala  
180 185 190

Ala Lys Lys Glu Ser Val Lys Ser Ala Val  
195 200

<210> 48  
<211> 207  
<212> PRT  
<213> Borrelia afzelii

<400> 48  
Glu Ser Ala Val Asp Glu Val Ser Lys Trp Leu Glu Glu Met Ile Lys  
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Ile Gly Asp Ser Asp Asn Asn Lys Gly Ala Val Ala Asp Lys Asp Ser  
35 40 45

Val Lys Gly Ile Ala Lys Gly Ile Lys Gly Ile Val Asp Ala Ala Gly  
50 55 60

Lys Ala Phe Gly Lys Asp Gly Asn Ala Leu Lys Asp Val Ala Lys Val  
65 70 75 80

Ala Asp Asp Ala Ala Gly Ala Asn Ala Asn Ala Gly Lys Leu Phe Ala  
85 90 95

Gly Asn Ala Ala Gly Gly Ala Ala Asp Ala Asp Asp Ala Asn Ile Ala

100 105 110  
Lys Ala Ala Gly Ala Val Ser Ala Val Ser Gly Glu Gln Ile Leu Lys  
115 120 125  
Ala Ile Val Asp Ala Ala Gly Ala Ala Asn Gln Asp Gly Lys Lys  
130 135 140  
Ala Ala Asp Ala Lys Asn Pro Ile Ala Ala Ile Gly Thr Asn Asp  
145 150 155 160  
Asp Gly Ala Glu Phe Lys Asp Gly Met Lys Lys Ser Asp Asn Ile Ala  
165 170 175  
Ala Ala Ile Val Leu Arg Gly Val Ala Lys Gly Gly Lys Phe Ala Val  
180 185 190  
Ala Asn Ala Ala Asn Asp Ser Lys Ala Ser Val Lys Ser Ala Val  
195 200 205

<210> 49  
<211> 210  
<212> PRT  
<213> Borrelia afzelii

<400> 49  
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35 40 45  
Ser Val Lys Glu Ile Ala Lys Gly Ile Lys Gly Ile Val Ala Ala Ala  
50 55 60  
Gly Lys Ala Phe Gly Lys Asp Gly Lys Asp Gly Asp Ala Leu Lys Asp  
65 70 75 80  
Val Glu Thr Val Ala Ala Glu Asn Glu Ala Asn Lys Asp Ala Gly Lys  
85 90 95  
Leu Phe Ala Gly Ala Asn Gly Asn Ala Gly Ala Ala Val Gly Asp Ile  
100 105 110  
Ala Lys Ala Ala Ala Val Thr Ala Val Ser Gly Glu Gln Ile Leu  
115 120 125  
Lys Ala Ile Val Asp Ala Ala Gly Asp Ala Asp Gln Ala Gly Lys Lys  
130 135 140  
Ala Ala Glu Ala Lys Asn Pro Ile Ala Ala Ile Gly Ala Asn Ala  
145 150 155 160

Ala Asp Asn Ala Ala Ala Phe Gly Lys Asp Glu Met Lys Lys Ser Asp  
165 170 175

Lys Ile Ala Ala Ala Ile Val Leu Arg Gly Val Ala Lys Asp Gly Lys  
180 185 190

Phe Ala Val Ala Asn Ala Asn Asp Asp Lys Lys Ala Ser Val Lys Ser  
195 200 205

Ala Val  
210

<210> 50  
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<213> Borrelia afzelii

<400> 50  
Glu Ser Ala Val Asp Glu Val Ser Lys Trp Leu Glu Glu Met Ile Thr  
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Ala Ala Gly Glu Ala Ala Thr Lys Gly Gly Asp Ala Gly Gly Ala  
20 25 30

Asp Lys Ile Gly Asp Val Gly Ala Ala Asn Asn Gly Ala Val Ala Asp  
35 40 45

Ala Ser Ser Val Lys Glu Ile Ala Lys Gly Ile Lys Gly Ile Val Asp  
50 55 60

Ala Ala Gly Lys Ala Phe Gly Lys Asp Gly Asn Ala Leu Lys Asp Val  
65 70 75 80

Ala Glu Val Ala Asp Asp Lys Glu Ala Gly Lys Leu Phe Ala Gly  
85 90 95

Asn Ala Gly Gly Ala Val Ala Asp Ala Ala Ala Ile Gly Lys Ala Ala  
100 105 110

Gly Ala Val Thr Ala Val Ser Gly Glu Gln Ile Leu Lys Ala Ile Val  
115 120 125

Asp Ala Ala Gly Gly Ala Asp Gln Ala Gly Lys Lys Ala Asp Ala Ala  
130 135 140

Lys Asn Pro Ile Ala Ala Ala Ile Gly Ala Asp Ala Ala Gly Ala Gly  
145 150 155 160

Ala Asp Phe Gly Asn Asp Met Lys Lys Arg Asn Asp Lys Ile Val Ala  
165 170 175

Ala Ile Val Leu Arg Gly Val Ala Lys Asp Gly Lys Phe Ala Ala Ala  
180 185 190

Ala Asn Asp Asp Asn Ser Lys Ala Ser Val Lys Ser Ala Val  
195 200 205

<210> 51  
<211> 204  
<212> PRT  
<213> Borrelia afzelii

<400> 51  
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20 25 30  
  
Lys Ile Gly Asp Ser Asp Ala Asn Asn Gly Ala Lys Ala Asp Ala Ser  
35 40 45  
  
Ser Val Asn Gly Ile Ala Asn Gly Ile Lys Gly Ile Val Asp Ala Ala  
50 55 60  
  
Gly Lys Ala Phe Gly Lys Glu Gly Ser Ala Leu Lys Asp Val Lys Thr  
65 70 75 80  
  
Val Ala Ala Glu Asn Glu Ala Asn Lys Asp Ala Gly Lys Leu Phe Ala  
85 90 95  
  
Gly Lys Asn Gly Asn Ala Asp Ala Ala Asp Ala Asp Ile Ala Lys  
100 105 110  
  
Ala Ala Gly Ala Val Ser Ala Val Ser Gly Glu Gln Ile Leu Lys Ala  
115 120 125  
  
Ile Val Asp Gly Ala Gly Asp Ala Ala Asn Gln Ala Gly Lys Lys Ala  
130 135 140  
  
Ala Glu Ala Lys Asn Pro Ile Ala Ala Ile Gly Thr Asn Glu Ala  
145 150 155 160  
  
Gly Ala Glu Phe Gly Asp Asp Met Lys Lys Arg Asn Asp Lys Ile Ala  
165 170 175  
  
Ala Ala Ile Val Leu Arg Gly Val Ala Lys Asp Gly Lys Phe Ala Val  
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Ala Asn Ala Ala Ala Asp Asn Ser Lys Ala Ser Val  
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<210> 52  
<211> 203  
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<213> Borrelia afzelii

<400> 52  
Glu Ser Ala Val Asp Glu Val Ser Lys Trp Leu Glu Glu Met Ile Lys  
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Ala Ala Gly Glu Ala Ala Thr Lys Gly Gly Asp Ala Gly Gly Ala

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Ser Val Lys Glu Ile Ala Asn Gly Ile Lys Gly Ile Val Asp Ala Ala			
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Gly Lys Ala Phe Gly Lys Glu Gly Ser Ala Leu Lys Asp Val Lys Thr			
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Val Ala Ala Glu Asn Glu Ala Asn Lys Asp Ala Gly Lys Leu Phe Ala			
85	90	95	
Gly Asn Ala Gly Asn Gly Ala Ala Asp Asp Ile Ala Lys Ala Ala Ala			
100	105	110	
Ala Val Thr Ala Val Ser Gly Glu Gln Ile Leu Lys Ala Ile Val Asp			
115	120	125	
Ala Ala Gly Asp Lys Ala Asn Gln Asp Gly Lys Lys Ala Ala Asp Ala			
130	135	140	
Lys Asn Pro Ile Ala Ala Ala Ile Gly Ala Ala Asp Ala Gly Ala Ala			
145	150	155	160
Ala Ala Phe Asn Glu Asn Asp Met Lys Lys Ser Asp Lys Ile Ala Ala			
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Ala Ile Val Leu Arg Gly Val Ala Lys Asp Gly Lys Phe Ala Ala Ala			
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<210> 53  
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<213> Borrelia afzelii

<400> 53			
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Val Asn Gly Ile Ala Asn Gly Ile Lys Gly Ile Val Asp Ala Ala Gly			
50	55	60	
Lys Ala Phe Gly Lys Asp Gly Ala Leu Ala Gly Val Ala Ala Ala			
65	70	75	80

Glu Asn Asp Asp Lys Lys Asp Ala Gly Lys Leu Phe Ala Gly Lys Asn  
85 90 95  
Gly Gly Ala Gly Ala Ala Asp Ala Ile Gly Lys Ala Ala Ala Val  
100 105 110  
Thr Ala Val Ser Gly Glu Gln Ile Leu Lys Ala Ile Val Asp Ala Ala  
115 120 125  
Gly Ala Ala Ala Asn Gln Ala Gly Lys Lys Ala Ala Asp Ala Lys Asn  
130 135 140  
Pro Ile Ala Ala Ala Ile Gly Thr Ala Asp Asp Gly Ala Glu Phe Lys  
145 150 155 160  
Asp Asp Met Lys Lys Ser Asp Asn Ile Ala Ala Ala Ile Val Leu Arg  
165 170 175  
Gly Val Ala Lys Asp Gly Lys Phe Ala Val Ala Asn Ala Asp Asp Asn  
180 185 190  
Lys Ala Ser Val Lys Ser Ala Val  
195 200

<210> 54  
<211> 197  
<212> PRT  
<213> Borrelia afzelii

<400> 54  
Glu Ser Ala Val Asp Glu Val Ser Lys Trp Leu Glu Glu Met Ile Thr  
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Ile Gly Asp Ala Ala Asn Asn Gln Gly Ala Lys Ala Asp Glu Ser Ser  
35 40 45  
Val Asn Gly Ile Ala Lys Gly Ile Lys Gly Ile Val Asp Ala Ala Gly  
50 55 60  
Lys Ala Phe Gly Lys Glu Gly Ser Ala Leu Lys Asp Val Ala Lys Val  
65 70 75 80  
Ala Asp Asp Asp Asn Lys Asp Ala Gly Lys Leu Phe Ala Gly Asn Ala  
85 90 95  
Gly Gly Gly Ala Gly Ala Asp Ile Ala Lys Ala Ala Ala Val Thr  
100 105 110  
Ala Val Ser Gly Glu Gln Ile Leu Lys Ala Ile Val Asp Ala Ala Gly  
115 120 125  
Ala Ala Asp Gln Ala Gly Ala Ala Ala Gly Ala Ala Lys Asn Pro Ile  
130 135 140

Ala Ala Ala Ile Gly Ala Asp Ala Gly Ala Ala Glu Glu Phe Lys Asp  
145 150 155 160

Glu Met Lys Lys Ser Asp Lys Ile Ala Ala Ala Ile Val Leu Arg Gly  
165 170 175

Val Ala Lys Gly Gly Lys Phe Ala Val Ala Ala Asn Asp Ala Ala Asn  
180 185 190

Val Lys Ser Ala Val  
195

<210> 55  
<211> 199  
<212> PRT  
<213> Borrelia afzelii

<400> 55  
Glu Ser Ala Val Gly Glu Val Ser Ala Trp Leu Glu Glu Met Ile Thr  
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Ala Ala Ser Glu Ala Ala Thr Lys Gly Gly Thr Gly Gly Thr Gly Gly  
20 25 30

Asp Ser Glu Lys Ile Gly Asp Ser Asp Ala Asn Asn Gly Ala Val Ala  
35 40 45

Asp Ala Ser Ser Val Lys Glu Ile Ala Lys Gly Ile Lys Gly Ile Val  
50 55 60

Asp Ala Ala Gly Lys Ala Phe Gly Lys Asp Gly Asn Ala Leu Lys Asp  
65 70 75 80

Val Ala Glu Val Ala Asp Asp Glu Ala Asn Ala Asp Ala Gly Lys Leu  
85 90 95

Phe Ala Gly Asn Ala Gly Asn Ala Ala Ala Ala Asp Val Ala Lys Ala  
100 105 110

Ala Gly Ala Val Thr Ala Val Ser Gly Glu Gln Ile Leu Lys Ala Ile  
115 120 125

Val Asp Ala Ala Gly Ala Ala Asp Gln Ala Gly Ala Lys Ala Asp Ala  
130 135 140

Ala Lys Asn Pro Ile Ala Ala Ile Gly Thr Asn Glu Ala Gly Ala  
145 150 155 160

Ala Phe Lys Asp Gly Met Lys Lys Arg Asn Asp Asn Ile Ala Ala Ala  
165 170 175

Ile Val Leu Arg Gly Val Ala Lys Ser Gly Lys Phe Ala Val Ala Ala  
180 185 190

Ala Asp Ala Gly Lys Ala Arg

<210> 56  
 <211> 207  
 <212> PRT  
 <213> *Borrelia afzelii*

<400> 56  
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   20               25               30  
  
 Gly Asp Ser Ala Asn Asn Gly Ala Val Ala Asp Ala Gly Ser Val Lys  
   35               40               45  
  
 Gly Ile Ala Lys Gly Ile Lys Gly Ile Val Asp Ala Ala Gly Lys Ala  
   50               55               60  
  
 Phe Gly Lys Glu Gly Asp Ala Leu Lys Asp Val Ala Lys Val Ala Asp  
   65               70               75               80  
  
 Glu Asn Gly Asp Asn Lys Asp Ala Gly Lys Leu Phe Ala Gly Glu Asn  
   85               90               95  
  
 Gly Asn Ala Gly Gly Ala Ala Asp Ala Asp Ile Ala Lys Ala Ala Ala  
   100               105               110  
  
 Ala Val Thr Ala Val Ser Gly Glu Gln Ile Leu Lys Ala Ile Val Glu  
   115               120               125  
  
 Ala Ala Gly Ala Gly Asp Ala Ala Asn Gln Ala Gly Lys Lys Ala Asp  
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 Glu Ala Lys Asn Pro Ile Ala Ala Ile Gly Thr Asp Asp Ala Gly  
   145               150               155               160  
  
 Ala Ala Phe Gly Gln Asp Asp Met Lys Lys Arg Asn Asp Asn Ile Ala  
   165               170               175  
  
 Ala Ala Ile Val Leu Arg Gly Val Ala Lys Gly Gly Lys Phe Ala Val  
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   195               200               205

<210> 57  
 <211> 153  
 <212> PRT  
 <213> *Borrelia afzelii*

<400> 57  
 Glu Ser Ala Val Asp Glu Val Ser Lys Trp Leu Glu Glu Ile Ile Thr  
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Ala Thr Gly Lys Ala Phe Gly Lys Asp Gly Asn Ala Leu Ala Gly Val  
20 25 30

Ala Lys Val Ala Asp Asp Glu Ala Asn Ala Asp Ala Gly Lys Leu Phe  
35 40 45

Ala Gly Glu Asn Gly Asn Ala Gly Ala Ala Ala Ile Gly Lys Ala Ala  
50 55 60

Ala Ala Val Thr Ala Val Ser Gly Glu Gln Ile Leu Lys Ala Ile Val  
65 70 75 80

Asp Ala Ala Gly Gly Ala Ala Gln Val Gly Ala Gly Ala Gly Ala Ala  
85 90 95

Thr Asn Pro Ile Ala Ala Ala Ile Gly Ala Ala Gly Asp Gly Ala Asp  
100 105 110

Phe Gly Lys Asp Glu Met Lys Lys Arg Asn Asp Lys Ile Ala Ala Ala  
115 120 125

Ile Val Leu Arg Gly Val Ala Lys Asp Gly Lys Phe Ala Ala Ala Ala  
130 135 140

Asn Asp Ser Lys Ala Ser Val Lys Ser  
145 150

<210> 58

<211> 202

<212> PRT

<213> Borrelia afzelii

<400> 58

Glu Ser Ala Val Asp Glu Val Ser Lys Trp Leu Glu Glu Met Ile Thr  
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Ala Ala Asp Ala Ala Ala Lys Val Gly Asp Ala Gly Gly Ala  
20 25 30

Asp Lys Ile Gly Asp Val Gly Ala Ala Asn Lys Gly Ala Lys Ala Asp  
35 40 45

Ala Ser Ser Val Lys Glu Ile Ala Lys Gly Ile Lys Gly Ile Val Asp  
50 55 60

Ala Ala Gly Lys Ala Phe Gly Gly Asp Ala Leu Lys Asp Val Lys Ala  
65 70 75 80

Ala Gly Asp Asp Asn Lys Glu Ala Gly Lys Leu Phe Ala Gly Ala Asn  
85 90 95

Gly Asn Ala Gly Ala Asn Ala Ala Ala Asp Asp Ile Ala Lys Ala  
100 105 110

Ala Gly Ala Val Ser Ala Val Ser Gly Glu Gln Ile Leu Lys Ala Ile

115	120	125
Val Glu Ala Ala Gly Ala Ala Asp Gln Ala Gly Val Lys Ala Glu Glu		
130	135	140
Ala Lys Asn Pro Ile Ala Ala Ile Gly Thr Asp Asp Ala Gly Ala		
145	150	155
Ala Glu Phe Gly Glu Asn Asp Met Lys Lys Asn Asp Asn Ile Ala Ala		
165	170	175
Ala Ile Val Leu Arg Gly Val Ala Lys Ser Gly Lys Phe Ala Ala Asn		
180	185	190
Ala Asn Asp Ala Gly Lys Lys Glu Ser Val		
195	200	
<210> 59		
<211> 201		
<212> PRT		
<213> Borrelia afzelii		
<400> 59		
Lys Ser Ala Val Asp Glu Ala Ser Lys Trp Leu Glu Glu Met Ile Thr		
1	5	10
		15
Ala Ala Gly Glu Ala Ala Thr Lys Gly Gly Thr Gly Glu Ala Ser Glu		
20	25	30
Lys Ile Gly Asp Val Gly Asp Asn Asn His Gly Ala Val Ala Asp Ala		
35	40	45
Asp Ser Val Lys Gly Ile Ala Lys Gly Ile Lys Gly Ile Val Asp Ala		
50	55	60
Ala Gly Lys Ala Phe Gly Lys Asp Gly Ala Leu Lys Asp Val Ala Ala		
65	70	75
		80
Ala Ala Gly Asp Glu Ala Asn Lys Asp Ala Gly Lys Leu Phe Ala Gly		
85	90	95
Gln Asp Gly Gly Ala Asp Gly Asp Ile Ala Lys Ala Ala Ala		
100	105	110
Val Thr Ala Val Ser Gly Glu Gln Ile Leu Lys Ala Ile Val Glu Ala		
115	120	125
Ala Gly Asp Lys Ala Asn Gln Val Gly Val Lys Ala Ala Gly Ala Ala		
130	135	140
Thr Asn Pro Ile Ala Ala Ile Gly Thr Asp Asp Asp Asn Ala Ala		
145	150	155
Ala Phe Asp Lys Asp Glu Met Lys Lys Ser Asn Asp Lys Ile Ala Ala		
165	170	175

Ala Ile Val Leu Arg Gly Val Ala Lys Asp Gly Lys Phe Ala Ala Asn  
180 185 190

Ala Asn Asp Asn Ser Lys Ala Ser Val  
195 200

<210> 60  
<211> 82  
<212> PRT  
<213> Borrelia afzelii

<400> 60  
Lys Ser Ala Val Asp Glu Val Ser Lys Trp Leu Glu Glu Met Ile Thr  
1 5 10 15

Ala Ala Ser Asp Ala Ala Thr Lys Gly Gly Thr Gly Glu Ala Ser Glu  
20 25 30

Lys Ile Gly Asp Ser Asp Ala Asn Lys Gly Ala Gly Ala Gly Ala Ala  
35 40 45

Phe Gly Glu Asn Asp Met Lys Lys Arg Asn Asp Asn Ile Ala Ala Ala  
50 55 60

Ile Val Leu Arg Gly Val Ala Lys Asp Gly Lys Phe Ala Val Lys Glu  
65 70 75 80

Asp Tyr

<210> 61  
<211> 179  
<212> PRT  
<213> Borrelia afzelii

<400> 61  
Met Glu Lys Ile Glu Lys Phe Lys Asn Lys Cys Gln His Lys Leu Gln  
1 5 10 15

His Lys Leu Ile Val Leu Val Ser Thr Leu Cys Tyr Ile Asn Asn Lys  
20 25 30

Asn Lys Lys Tyr Ser Gln Ser Asn Ile Leu Tyr Tyr Phe Asn Glu Asn  
35 40 45

Leu Lys Arg Asn Gly Gln Thr Pro Ile Lys Ile Lys Thr Leu Gln Asn  
50 55 60

Tyr Leu Tyr Lys Leu Glu Lys Glu Phe Glu Val Thr Thr Asn Tyr Tyr  
65 70 75 80

Lys His Leu Gly Val Asn Cys Gly Thr Glu Ile Tyr Tyr Lys Leu Lys  
85 90 95

Tyr Gln Lys Gln Lys Cys Tyr His Lys Ile Asn Gln Tyr Phe Lys Lys

100 105 110  
Lys Lys Glu Ile Lys Phe Asn Leu Arg Val Ser Ala Phe Phe Asn Lys  
115 120 125

Lys His Ser Lys Lys Gly Ser Val Glu Leu Lys Glu Cys Asn Asn Asn  
 130 135 140

Asn	Asn	Asn	Lys	Glu	Lys	Glu	Thr	Ser	Gln	Lys	Ile	Glu	Ile	Leu	Gln
145					150					155					160

Thr Lys Val Tyr Ala Lys Lys Cys Lys Phe Leu Thr Asn Tyr Tyr Thr  
 165 170 175

Lys Ile Leu

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aaaacggggg ttgctgcgga tgctgaaaat ccgattgacg cggctattgg gggtgccgat 2100  
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ggtgatgctg ggaaggctgc tgctgcggg gctgctgtt gttgggagca gatattaaaa 2580  
gcgattgttgc atgctgctaa agatggatg aagacggggg ttactgtatg aaaggatgct 2640  
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ggcagtttgc 2775

<210> 63  
<211> 2075  
<212> DNA  
<213> *Borrelia garinii*

<400> 63  
ataaaggggg ttgttgc tgctgagaag gctgatgcg aggaaggaa gttggatgt 60  
gctggatgat ctggtaaac taacaaggat gctggaaatg ttgttgc gaaacaatgg 120  
aatgagggtg gtatgcaga tgatgctggg aaggctgctg ctgcgggtgc tgctgttagt 180  
ggggagcaga tattaaaagc gattgttgc gctgtaagg gtggatgaa gacgggtaa 240  
aataatgtga aggatgctgaa atatccgatt gaggcggcta ttgggagtag tgccgatgct 300  
gtatgcgcgg ctgttaataa ggagggtatg aagaaggatg atcagattgc tgctgctatg 360  
gttctgaggg gaatggctaa ggatggcgatg ttgcgttgc cgaatgtatgc tgctgctcat 420  
gaaggactg ttaagaatgc tggtggatg gcaacaataa agaccgttgc tgctttggct 480  
aacttggttc gaaagaccgt gcaagctggg ttgaagaagg ttgggatgt ttttaagaat 540  
agtgaggca aagatggatg tgccgcgatg ttatgggaa ttgctaagg gataaagggg 600  
attgttgc tgctgagaa ggctgatgcg aaggaaggaa agttggatgt ggctgggtgc 660  
gctggtaaa ctaacaagga tgctggaaatg ttgttgc gaaagaataa tgagggtgt 720  
gaagcaatg atgctggaa ggctgctgcg gcccgtgcg ctgttagtgg ggagcagata 780  
ttaaaagcga ttgttgc tgctaaaggat ggtgatgata agcagggtaa gaaggctgag 840  
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gcggcggtta ataataatgaa gaaggatgat cagattgcg ctgcgtatgg tctgagggg 960  
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<210> 64  
<211> 2775  
<212> DNA  
<213> *Borrelia garinii*

<400> 64  
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taattattta atactattca gcagtaaattt ctataagtca ttaattattt aatactattc 180  
agcagtaaat tctataagtca attaattattt taatactattt cagcagtaaa ttctataagt 240  
cattaattat ttaatactat tcagcagtaa attctataag tcattaatta tttaataacta 300  
ttcagcagta aattctataa gtcattaattt caatttagtta acggattttt agatgtattc 360  
acctctttt gttggattttt tgccatgtca ttggggttt aagctgtatcc aaaaaatct 420  
gtatgtaaaaa cttattttga atctctagct aaaaaattttt aagaaacaaa agatggttt 480  
actaagtgtt ccaaaggtaa tgacgggtat actggaaagg ctgggtatgc tggtgggct 540  
gggtggcgct ctatgtctgc aggtggcgct ggtgggattt agggcgctat aacagagatt 600  
agcaaatgggt tagatgatata ggcggaaagct gctgcggaaag ctgcaagtgc tgctactgg 660  
aatgcagcaa ttggggatgt tgtaatggt aatggtggag cagcaaaagg tggtgtatgcg 720  
gagagtgtta atgggattgc taaggggata aaggggattt tgatgtctgc tgagaaggct 780  
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ggcgatgtatgc gttgtatgc 2775

<210> 65  
<211> 2075  
<212> DNA  
<213> *Borrelia garinii*

<400> 65  
ataaaaggga ttgttgc tgcgtgaaag gctgatgcg aggaaaggaa gttggatgt 60  
gctggatg ctggtaaac taacaaggat gctggaaat tttgtgaa gaacaatgt 120  
aatgagggtg gtatgcaga tggatgtggg aaggctgctg ctgcgggtc tgctgttagt 180  
ggggagcaga tattaaaagc gattgtgat gctgtaagg gtggatgaa gacggtaag 240  
aataatgtga aggatgtga aaatccgatt gaggcggcta ttgggatgt tgccgatgt 300  
gtatgcgtgg cgttaataaa ggaggggatg aagaaggatg atcagattgc tgctgctatg 360  
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gaagggactg ttaagaatgc tttttggatg gcaacaaata agaccgttgc tgcttggct 480  
aacttggttc gaaagaccgt gcaagctggg ttgaaaggatg ttgggatgt tgtaagaat 540  
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gagaaggctg atgcgaagga agggaaatgtt aatgtggctg gtgcgtgtgg tgctgagggt 1260  
aacgaggctg ctgggaagct ttgttgcag aagaatgtc gtatgcattt tggtgaagca 1320  
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tatttgcataa aacttcaaaat cgaatgtttt agttt 2075

<210> 66  
<211> 184  
<212> PRT  
<213> *Borrelia garinii*

<400> 66  
Glu Gly Thr Val Lys Asn Ala Val Asp Met Ala Lys Ala Ala Ala Val  
1 5 10 15

Ala Ala Ser Ala Ala Thr Gly Asn Ala Ala Ile Gly Asp Val Val Lys  
20 25 30

Ser Asn Gly Gly Ala Ala Lys Gly Gly Asp Ala Ala Ser Val Asn  
35 40 45

Gly Ile Ala Lys Gly Ile Lys Gly Ile Val Asp Ala Ala Glu Lys Ala  
50 55 60

Asp Ala Lys Glu Gly Lys Leu Asp Val Ala Gly Ala Ala Gly Glu Thr  
65 70 75 80

Asn Lys Asp Ala Gly Lys Leu Phe Val Lys Lys Asn Gly Asp Asp Gly  
85 90 95

Gly Asp Ala Gly Asp Ala Gly Lys Ala Ala Ala Ala Val Ala Ala Val  
100 105 110

Ser Gly Glu Gln Ile Leu Lys Ala Ile Val Asp Ala Ala Lys Asp Gly  
115 120 125

Asp Lys Thr Gly Val Thr Asp Val Lys Asp Ala Thr Asn Pro Ile Asp  
130 135 140

Ala Ala Ile Gly Gly Ser Ala Asp Ala Asn Ala Glu Ala Phe Asp Lys  
145 150 155 160

Met Lys Lys Asp Asp Gln Ile Ala Ala Ala Met Val Leu Arg Gly Met  
165 170 175

Ala Lys Asp Gly Gln Phe Ala Leu  
180

<210> 67

<211> 140

<212> PRT

<213> *Borrelia garinii*

<400> 67

Ile Lys Gly Ile Val Asp Ala Ala Glu Lys Ala Asp Ala Lys Glu Gly  
1 5 10 15

Lys Leu Asp Val Ala Gly Asp Ala Gly Glu Thr Asn Lys Asp Ala Gly  
20 25 30

Lys Leu Phe Val Lys Asn Asn Gly Asn Glu Gly Asp Ala Asp Asp  
35 40 45

Ala Gly Lys Ala Ala Ala Val Ala Ala Val Ser Gly Glu Gln Ile  
50 55 60

Leu Lys Ala Ile Val Asp Ala Ala Lys Gly Gly Asp Lys Thr Gly Lys  
65 70 75 80

Asn Asn Val Lys Asp Ala Glu Asn Pro Ile Glu Ala Ala Ile Gly Ser  
85 90 95

Ser Ala Asp Ala Asp Ala Ala Phe Asn Lys Glu Gly Met Lys Lys  
100 105 110

Asp Asp Gln Ile Ala Ala Met Val Leu Arg Gly Met Ala Lys Asp

115

120

125

Gly Gln Phe Ala Leu Thr Asn Asp Ala Ala Ala His  
130 135 140

<210> 68  
<211> 942  
<212> DNA  
<213> *Borrelia garinii*

<400> 68  
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gatatgacaa aagctgctgc gggtgctgca agtgcgtcaa gtgcgtctac tggtaatgca 120  
gcaattgggg atgttgttaa tggtaatgtat ggagcagcaa aaggtggtaa tgcggcgagt 180  
gttaatggga ttgctaaaggaa gataaagggg attgttgtat ctgcgtgagaa ggctgatgcg 240  
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aagctgtttg tgaagaagaa tgctgggtat catgggtgt aagcaggtga tgctgggagg 360  
gctgctgtgc cggttgcgtc tgtagtggg gagcagatataaaagcgat tgttgatgct 420  
gctaaggatgt gtgggtataa gcagggtaaag aaggctgagg atgctgaaaa tccgattgac 480  
gcggctattt ggagtacggg tgccgatgat aatgcgtctg aggcgtttgc tactatgaag 540  
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gcttgaagg atgctgctca tgataatcat ctgcagccaa gcttaatttgc tgagcttgg 660  
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cggttgcgc cggcggttt ttattggta gaatccaagc tagctggcg agattttcag 780  
gagctaaggaa agctaaaatg gaaaaaaat cactggatataaccaccgttgc atatatccca 840  
atggcatcgt aaagaacatt ttgaggcatt tcagtcagtt gctcaatgta cctataacca 900  
gaccgttcag ctggatatta cggcctttt aaagaccgta ag 942

<210> 69  
<211> 217  
<212> PRT  
<213> *Borrelia garinii*

<400> 69  
Met Arg Gly Ser His His His His His Gly Ser Lys Gly Thr Val  
1 5 10 15

Lys Asn Ala Val Asp Met Thr Lys Ala Ala Ala Val Ala Ala Ser Ala  
20 25 30

Ala Ser Ala Ala Thr Gly Asn Ala Ala Ile Gly Asp Val Val Asn Gly  
35 40 45

Asn Asp Gly Ala Ala Lys Gly Gly Asp Ala Ala Ser Val Asn Gly Ile  
50 55 60

Ala Lys Gly Ile Lys Gly Ile Val Asp Ala Ala Glu Lys Ala Asp Ala  
65 70 75 80

Lys Glu Gly Lys Leu Asn Val Ala Gly Ala Ala Gly Ala Glu Gly Asn  
85 90 95

Glu Ala Ala Gly Lys Leu Phe Val Lys Lys Asn Ala Gly Asp His Gly  
100 105 110

Gly Glu Ala Gly Asp Ala Gly Arg Ala Ala Ala Ala Val Ala Ala Val  
115 120 125

Ser Gly Glu Gln Ile Leu Lys Ala Ile Val Asp Ala Ala Lys Asp Gly  
130 135 140

Gly Asp Lys Gln Gly Lys Lys Ala Glu Asp Ala Glu Asn Pro Ile Asp  
145 150 155 160

Ala Ala Ile Gly Ser Thr Gly Ala Asp Asp Asn Ala Ala Glu Ala Phe  
165 170 175

Ala Thr Met Lys Lys Asp Asp Gln Ile Ala Ala Ala Met Val Leu Arg  
180 185 190

Gly Met Ala Lys Asp Gly Gln Phe Ala Leu Lys Asp Ala Ala His Asp  
195 200 205

Asn His Leu Gln Pro Ser Leu Ile Ser  
210 215

<210> 70

<211> 663

<212> DNA

<213> *Borrelia afzelii*

<400> 70

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<213> *Borrelia afzelii*

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20 25 30

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35 40 45

Val Gly Asp Asn Asn His Gly Ala Val Ala Asp Ala Asp Ser Val Lys  
50 55 60

Gly Ile Ala Lys Gly Ile Lys Gly Ile Val Asp Ala Ala Gly Lys Ala  
65 70 75 80

Phe Gly Lys Asp Gly Ala Leu Lys Asp Val Ala Ala Ala Gly Asp  
85 90 95

Glu Ala Asn Lys Asp Ala Gly Lys Leu Phe Ala Gly Gln Asp Gly Gly  
100 105 110

Gly Ala Asp Gly Asp Ile Ala Lys Ala Ala Ala Ala Val Thr Ala Val  
115 120 125

Ser Gly Glu Gln Ile Leu Lys Ala Ile Val Glu Ala Ala Gly Asp Lys  
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Ala Asn Gln Val Gly Val Lys Ala Ala Gly Ala Ala Thr Asn Pro Ile  
145 150 155 160

Ala Ala Ala Ile Gly Thr Asp Asp Asp Asn Ala Ala Ala Phe Asp Lys  
165 170 175

Asp Glu Met Lys Lys Ser Asn Asp Lys Ile Ala Ala Ala Ile Val Leu  
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